ENVIRONMENTAL PROTECTION AGENCY (EPA)
2019 & 2020 Targeted Airshed Grant Program
RFA#: EPA-OAR-OAQPS-20-01

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Project Title: Response to Wildfires & Diesel Reduction: Generators to Tier 4 and Battery Storage

Applicant Information:

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Total Project Cost:	$6,910.692
EPA Funds Requested:	$6,308,920
Voluntary Cost Share:	$601,772

Short project description: The BAAQMD will implement a program to replace approximately 8,200 hp of prime diesel generators with 6 MW of zero-emission battery storage, and 17,500 hp of standby or backup diesel generators with Tier 4 engines.

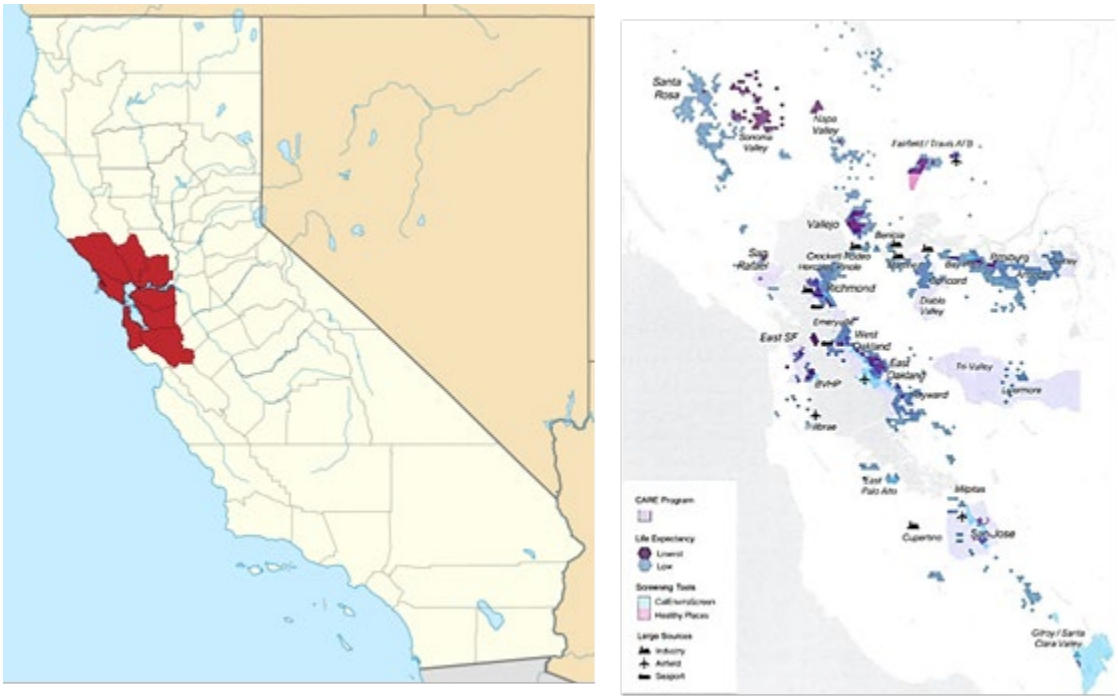
Project Period: Beginning date: August 2020; Ending date: August 2025

Project Location: San Francisco Bay Area air basin, prioritizing funding on the region's most highly-impacted areas and Environmental Justice communities.

1. Project Summary and Approach

Approach and Technology. The Bay Area Air Quality Management District (BAAQMD) was created by the California Legislature in 1955 as the first regional air pollution control agency in the country. The BAAQMD aims to create a healthy breathing environment by protecting and improving public health, air quality, and the global climate. The BAAQMD regulates and permits stationary sources of air pollution, conducts air quality monitoring, planning, enforcement, outreach and community engagement, and utilizes grant and incentive programs to support its mission. The San Francisco Bay Area air basin is home to seven million residents and includes the nine counties shown in Figure 1.

Figure 1. Maps of the San Francisco Bay Area air basin and Community Health Projection/ Environmental Justice Areas.



The BAAQMD has permitting authority for internal combustion engines and generators greater than 50 hp. Equipment smaller than 50 hp is unregulated. In the San Francisco Bay Area, there are more than 8,000 permitted diesel generators that operate under a permit issued by BAAQMD. In 2018, these diesel generators reported annual emissions of over 50 tons of PM2.5.

Diesel exhaust includes over 40 substances that are listed by the U.S EPA as hazardous air pollutants and by the California Air Resources Board as toxic air contaminants. Diesel exhaust can trigger immediate respiratory distress, especially in children, the elderly and those with asthma, COPD, emphysema, and other chronic lung and heart conditions. Impacts most often fall heavily on communities and populations already significantly impacted by air pollution, environmental

hazards, and economic inequality. In addition to air pollution, generators also cause potential fire hazard.[1]

These harmful emissions and impacts from diesel generators are exacerbated by Public Safety Power Shutoffs. In California, catastrophic wildfire risk has caused these pre-emptive power shutoffs that have affected businesses, government agencies, and residents and increased the purchase and usage of generators. In the fall of 2019, pre-emptive power shutoffs and probable backup generator usage coincided with wildfires on days when regional air pollution in the San Francisco Bay Area reached levels that exceeded state and national standards. The California Air Resources Board (CARB) is drafting a study to model the number and usage of generators resulting from PSPS, and the emissions impacts of increased usage on a state level basis.[2],[3]

Since 1991, the BAAQMD has administered more than $1.2 billion in funding, including the successful completion of the Diesel Emissions Reduction Act (DERA) grants. These incentive programs are designed to achieve voluntary or "surplus" emission reductions, i.e., reductions in advance of, or over and above, regulatory requirements or standards. Over the past five years, BAAQMD has annually awarded on average $65 million through its grant and incentive programs, however this funding either may not, or only on a very limited basis, be used to fund lawn & garden equipment, wood-burning devices, and stationery and portable engine replacement projects.

The BAAQMD proposes to use EPA Targeted Airshed Grant program funds to develop and implement a program that reduces localized sources of PM2.5 by accelerating the adoption of zero-emissions equipment that supports resiliency and prioritizes disadvantaged communities. Specifically, BAAQMD proposes to 1) increase available grant funding for existing BAAQMD programs that target localized emissions impacts, and 2) to develop new funding categories for the replacement of pre-tier 4 generators. Zero-emission options , including both electric-battery storage and hydrogen fuel-cell technologies have recently become more widely commercially available and so targeting these categories will have a direct and immediate impact on community health, as well as help owners become more comfortable with these clean technologies making them more commonly used in general. The BAAQMD's available grant funding is restricted and can fund only scrap and replacements of generators that are 25hp and higher.

BAAQMD is proposing to develop a new funding program to scrap and replace pre-Tier 4 standby and primary generators; funds would go toward the purchase of Tier 4 or zero-emission battery storage. Many older and smaller generators face low levels of regulation, with owner operators utilizing dirtier models. Diesel generators are significant sources of direct PM2.5, have increasingly available Tier 4 and zero-emission replacement options that would achieve ongoing, surplus reductions of PM2.5, and are equipment categories that the BAAQMD currently lacks significant funding for.

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[1] https://www.sfchronicle.com/california-wildfires/article/During-PG-E-outages-generators-caused-fires-14833601.php

[2] https://www.latimes.com/california/story/2019-10-19/pg-e-ten-years-of-power-shutoffs

[3] https://ww2.arb.ca.gov/sites/default/files/2020-01/Emissions_Inventory_Generator_Demand%20Usage_During_Power_Outage_01_30_20.pdf

For nearly 30 years, the BAAQMD has administered programs that provide grants and incentives to projects that achieve "surplus" emission reductions, i.e., reductions in advance of, or over and above, regulatory requirements or standards. As regulations on emissions standards for mobile and stationary sources have becoming increasingly stringent, grants and incentives play a more critical role in helping owners and operators to voluntarily upgrade combustion-based equipment with the cleanest zero-emission technologies. For the last five years, BAAQMD's budget has included approximately $65 million annually in revenue for grants and incentives, however the majority of those funds may only be for projects that fund the replacement of diesel powered medium and heavy-duty on-road and off-road mobile sources, such as trucks and buses, marine vessels, and locomotives. At the same time, BAAQMD has had very limited opportunity to fund equipment replacements of stationary sources, such as prime and standby emergency generators, which are significant sources of PM2.5.

In developing BAAQMD's proposal, we considered the sources of PM2.5 emissions based on BAAQMD's inventory, input from community members on which localized sources of PM2.5 contribute to high risk and exposure and should be prioritized for funding, and gaps in BAAQMDs incentive programs, where funding and the types of equipment that are eligible for funding are limited. An incentive program to replace standby and primary generators with Tier 4 and zero-emission battery storage will allow BAAQMD to directly meet needs in all of these important areas by:

- reducing diesel PM2.5 regionally, especially during high usage periods such as Public Safety Power Shutoffs,
- targeting health risk reduction in communities, and,
- funding clean-technology for an equipment category that has lacked funding in the past.

Other Available Technologies Considered. The BAAQMD regulates, permits and enforces stationary sources of air pollution, and conducts air quality monitoring, public outreach, and grant and incentive programs. Over the past 60 years, the BAAQMD's efforts have significantly improved air quality in the region. However, additional effort and funding are needed to help the region in come into attainment and to reduce localized sources that contribute to high rates of exposure to PM2.5.

Of the largest sources of PM2.5 emissions that the BAAQMD does not have regulatory authority over, mobile sources, woodburning devices, L&G equipment, stationary and portable engines are the categories that have the most potential for cost-effective emissions reductions. Incentives have played a critical role in reducing major contributors to PM2.5 through the replacement of medium and heavy-duty on-road and off-road mobile sources. BAAQMD has state and local funding that can be used to provide incentives to reduce PM2.5 from these sources, however it lacks funding to adequately target emissions reduction from stationary and portable engines.

For these reasons, this application is seeking funds for the replacement of stationary and portable prime and back-up generators. Since BAAQMD also lacks significant funding for smaller point sources of air pollution, a separate application is being submitted to EPA that targets PM2.5 reduction from residential woodburning devices and lawn and garden equipment.

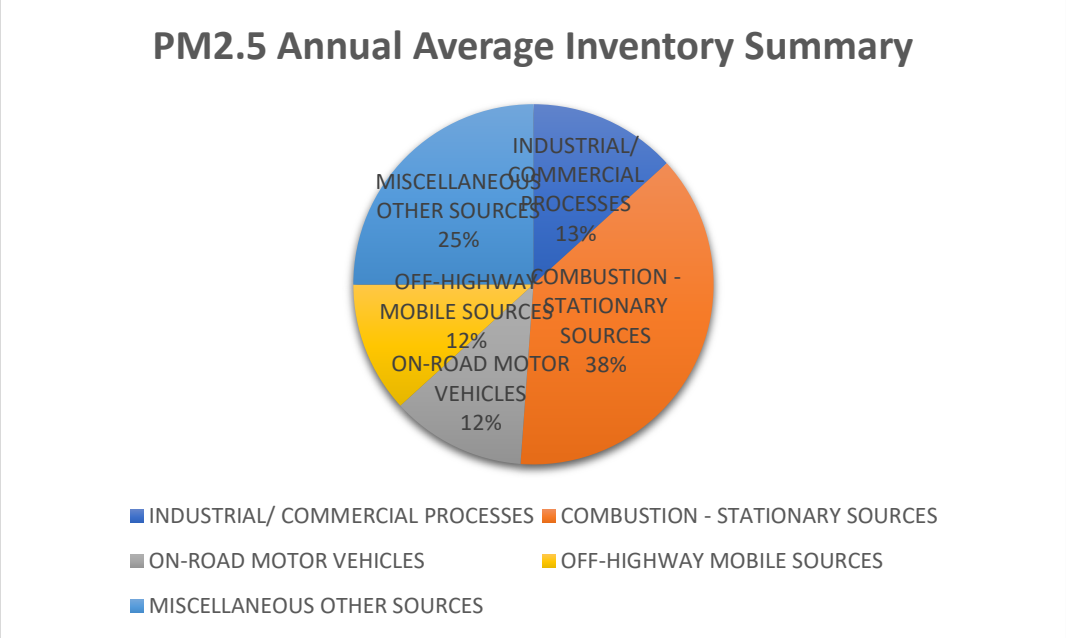
For the proposed Targeted Airshed Grant program, BAAQMD considered other behind the meter (BTM) technologies for the replacement of prime generators utilizing natural gas such as fuel

cells. Though natural gas is considered a relatively clean alternative fuel that can act as a "bridge" fuel to zero emissions, new stationary applications may still require the implementation of pipeline infrastructure. This causes concern for leakage and methane emissions, as well as for incentivizing long-term continued use of that natural gas pipeline infrastructure due to sunk costs. In 2019, many cities in the Bay Area started to implement natural gas bans, thus in order to align with policy from local jurisdictions, moving forward BAAQMD will not incentivize natural gas equipment for stationary applications. BAAQMD is only proposing projects that are zero emissions when cost effective, or Tier 4 as a last option.

Emissions Inventory, Key Source Categories. Over the past four decades, concentrations of all criteria pollutants have been greatly reduced in the San Francisco Bay Area and the BAAQMD has attained national standards for four of the six criteria pollutants. While the region has achieved reductions in ozone and PM however, the BAAQMD has not yet attained all state and national standards for ozone and PM. In 2018, the San Francisco Bay Area had three days of exceedances for the National 8-hour ozone standard and twenty days of exceedances for the National 24-Hour PM2.5 Standard.

The recent exceedances coincided with wildfires and wildfire season, which is also when generators would likely be used. Therefore, this approach would target PM2.5 during higher risk periods of exceedances and help bring the region towards attainment.

Based on the BAAQMD's 2011 *Baseline Emission Inventory Projections for 2015 and 2020—Annual Average Inventory for PM 2.5 (Tons/Day)*, grand total emissions in the San Francisco Bay Area is calculated at 46.6 tons/day PM2.5. Key contributors of PM2.5 in the San Francisco Bay Area come from fuel combustion at industrial sources such as refineries and manufacturing facilities (12%), and an almost equally large percentage of PM2.5 comes from on-road motor vehicles (11%). Stationary engines and generators contributed approximately 0.3 tons/day. For further detail, please see *Other Narrative Attachments- Emission Inventory.*



Based on BAAQMD's January 2020 permitting and reporting data, there are over 8,000 diesel generators permitted in the Bay Area; of those, 7,688 are back-up generators (BUGs) and 314 are prime generators.

The proposed approach and projects would reduce emissions of PM2.5 by 2.8 tons per year, based on calculations of the replacement of over 25,000 hp worth of equipment with 6 MW of battery storage and 16,700 hp of Tier 4. For calculations based on the average reported emissions rates, as well as expected emissions for Tier 4 based on EPA emission factors, please see attachment *Engineering SID Data Request-Generators.* Future forecasted emission reduction calculations also assume that 2018 reported usage from permitted units would increase nine-fold, based on the number of days that there were large power shut-offs in the San Francisco Bay Area in 2019. The replacement of primary and standby emergency generators with zero-emission and Tier 4 technologies would reduce PM2.5 from significant sources. Proposed outreach surrounding the program would also serve to educate current diesel generator owners on the negative health and air quality impacts of diesel combustion and diesel generator usage.

In addition to reducing regional impacts, the proposed approach will also benefit community health at the local level by replacing prime engines with zero-emission battery technology, smaller generators whose emissions are unregulated, and lower-tier larger backup generators whose usage spikes during Public Safety Power Shutoffs.

New and existing CI and LSI engines greater than or equal to 25 horsepower on mobile or portable off-road equipment and stationary agricultural equipment are eligible for funding.

New approach & Lowest emission technologies. Existing and proposed programs to fund BTM battery storage in California lack emphasis on direct emissions reductions. Examples of these include the state's Self-Generation Incentive Program,[4] which focuses on technology and market development, as well as local Community Choice Aggregator procurement efforts[5]. The proposed project would be an innovative and new approach to support not only resiliency, a topic of strong interest in California, but also criteria air pollutant emission reductions. Combining the requirement of scrapping diesel generators and replacing with either BTM batteries or Tier 4 engines supports the lowest emission technologies available, proving that providing resiliency in the event of grid outages can also offer air quality improvements as well as cost-savings during normal operations.

Lithium-ion batteries are zero-emission technologies that have been commercialized since the 1990s. However, the costs were historically too high to store power in large amounts. Only recently has battery technology become widely available as options for residential, commercial and industrial applications. Decreasing lithium-ion battery costs and better performance have pushed energy storage technologies to the forefront of energy modernization efforts and are proving effective and valuable for resiliency purposes. In October 2019, amongst a wide power

[4] https://www.cpuc.ca.gov/sgip/

[5] *Bay Area CCAs Solicit 30MW of Distributed Batteries to Weather Grid Outages.* November 5, 2019. https://www.greentechmedia.com/articles/read/bay-area-cca-solicit-30mw-of-distributed-batteries-to-weather-grid-outages

outage affecting 115,000 facilities in Vermont, 1,100 homes managed to remain with power due to pilot programs specifically designed to promote resilient backup power with energy storage.[6]

In scenarios where battery storage is not economically workable, Tier 4 nonroad engines are near-zero option technologies that are reliable, proven and available today at a lower cost that justifies only occasional back-up usage. Tier 4 standards require that emissions of PM and NOx be reduced by about 90% over unregulated levels.

Tier 4 engines are designed to optimize fuel efficiency while minimizing pollution. Past engines used mechanical fuel injection, whereas today's Tier 4 engines are largely computer-controlled, resulting in continual monitoring of real-time engine conditions and adjustment of the fuel / air mixture in the combustion chamber to maximize performance and minimize the emissions of harmful pollutants. This advanced combustion technology converts fuel to energy more efficiently and cleanly.

Tier 4 engines will also be required to utilize ultra-low sulfur diesel (ULSD), which contains only 15 parts per million (ppm) of sulfur. Newer engine designs are fitted with advanced emission control systems to filter out any nitrogen oxide (NOx) and particulate matter (PM) before releasing exhaust to the environment.[7]

Roles and Responsibilities. The BAAQMD will serve the role of Program Administrator and will be responsible for:

- program development: researching and establishing a list of eligible equipment and manufacturers, preparing solicitation and outreach materials, updating BAAQMD's existing grants management system to accept, process, and track applications, and contracts awarded
- conducting public outreach to the potential applicants through website development, e-mails and other channels;
- reviewing and evaluating applications, and preparing contracts;
- project monitoring and reporting; and
- performing audit inspections for 10% of both old and/or new equipment.

On a limited basis, BAAQMD may utilize sub-contractors selected through a formal Request for Proposals process to fulfill some of these functions e.g., in cases where administrative savings or other efficiencies can be achieved.

Sub-grantees will be responsible for:

- requesting vendor quotes for the purchase and installation of BTM battery storage;
- initial payments, filling out voucher forms or applications with required documentation;
- where applicable, signing contracts;
- scheduling and implementing the removal and destruction of old equipment;
- purchasing and documenting the new zero-emission technology, processing requests for reimbursement; and

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[6] *Batteries vs. Blackouts: 1,100 Homes Powered Through Vermont Outage With Storage.* November 7, 2019. https://www.greentechmedia.com/articles/read/green-mountain-power-kept-1100-homes-lit-up-during-storm-outage

[7] https://www.ckpower.com/the-evolution-of-clean-diesel-technology-in-response-to-tier-4/

- cooperating with grant program requirements: e.g., reporting, inspections, and audits.

Dismantlers and contractors will be responsible for:

- the destruction of old equipment and verification forms, either directly submitted to the BAAQMD or indirectly by sub-grantees to submit to BAAQMD; and
- public outreach and community engagement: selection of event locations and event promotion.

2. Community Benefits, Engagement and Partnerships

Historically, the BAAQMD's programs have focused on improving air quality on a regional scale, focusing on sources that have the largest emissions region-wide. However, today there is recognition that while air quality has improved over time, some of the Bay Area's communities are still experiencing disproportionate impacts from air pollution and other environmental hazards. These communities were identified through assessments of air quality, health, and other metrics of vulnerability by the BAAQMD's Community Air Risk Evaluation Program (CARE) and, more recently, through our Community Health Protection Program (CHPP)[8]. The areas identified are consistent with the results from other state-wide and national assessments, including Cal Enviroscreen, EJ Screen, and the Healthy Places Index.

Through the CHPP, the BAAQMD partners with community members and environmental justice organizations on community-led activities to identify and understand air pollution concerns on a hyperlocal scale to develop and implement Community Emission Reduction Plans that include specific strategies to reduce air pollution emissions and exposure to improve community health. The work performed with communities has highlighted the need for additional reductions at a local scale. Reducing emissions of smaller in-community sources of air pollution such as stationary and portable prime and back-up generators, can significantly improve the health of people that live, work, and play in these locales.

The CHPP coordinates robust and ongoing community engagement for the Bay Area priority areas as part of the AB 617 statute implementation of community steering committees, as well as CHPP Grants. The AB 617 Community Air Monitoring and Communities Emission Reduction Programs are community-led processes that are guided by multi-stakeholder steering committees. These include community members, CBOs that serve the community, local youth, as well as representatives from local government, public health offices, and local businesses and industry. These partnerships provide routine and ongoing opportunities for outreach with such new incentive programs, as they are funded.

In October 2019, the BAAQMD's Board of Directors adopted the Community Emissions Reduction Plan for the West Oakland Community, also known as the West Oakland Community Action Plan (WOCAP). The WOCAP contains community-led recommendations for measures that, if implemented, would reduce health risk and exposure to emissions from local sources of air

[8] More details of the health burden assessments can be found on the websites for these programs: https://www.baaqmd.gov/community-health/community-health-protection-program/community-air-risk-evaluation-care-program and https://www.baaqmd.gov/community-health/community-health-protection-program.

pollution and toxic air contaminants. The WOCAP identifies the need to provide inactive funding to accelerate the replacement of stationary sources, including back-up generators. At least 60% of the EPA TAG monies will be awarded to projects the BAAQMD will develop program criteria that prioritizes funding for projects located in the region's most impacted communities.

3. Project Sustainability

Since the replacement technologies selected for this program are zero-emissions, the project will achieve **permanent quantifiable and voluntary reductions of PM 2.5 and NOx.** The work conducted under this program will be key in helping to document the potential benefits from replacement projects that provide highly localized benefits and serve as a model for how these categories could successfully be added to the program.

In addition to the proposed project, the BAAQMD's will continue to reduce PM emissions generated in the region through the following measures and activities:

- Regulations and permit requirements on stationary sources to limit PM emissions.
- Wood burning regulations to limit PM emissions from residential wood smoke.
- Control measures in the 2010 Clean Air Plan(2 Mb PDF, 287 pgs, revised 06/17/15) to reduce PM emissions.
- A comprehensive report (PDF) and summary (PDF) evaluating PM in the Bay Area.
- Preparation of an abbreviated State Implementation Plan to address U.S. EPA planning requirements.
- Administer grant programs to award an average of $65 million annually to sponsors who voluntarily replace older equipment that emits PM with cleaner alternatives.
- Public outreach to solicit input on our PM planning activities (archived webcasts and key documents are available in the table below).
- Extensive public outreach through the Winter Spare the Air program to encourage residents to refrain from wood-burning and notify when high PM levels are expected.

In addition, the BAAQMD's Climate Tech Finance program also offers subsidized financing for public and private facilities to adopt emerging technologies, including battery storage as well as larger systems utilizing battery storage such as micro-grids. For eligible subgrantee projects where total required costs are greater than grant funds awarded, the Climate Tech Finance program is an option for financing the remaining costs and where BAAQMD could provide leveraged funding.

The program is offered through a partnership with the California Infrastructure and Economic Development Bank (IBank). Direct loans are available to San Francisco Bay Area public facilities, including municipalities, universities, schools, hospitals, and eligible nonprofits. Loan amounts can range from $500,000 to $30 million, with terms of up to 30 years. BAAQMD charges 0% origination fees and 0% interest for the program to subgrantees. In instances where subgrantees choose to finance the remaining cost for their distributed energy system through the Climate Tech Finance program, leveraged funding contributed by BAAQMD through financing costs are illustrated below.

Loan Amount	**$1M**	**$1M**	**$1M**	**$1M**

Loan Term	10	15	20	30
Interest Rate Examples	3.06%	3.13%	3.17%	3.21%
Leveraged Funds from BAAQMD	$21,154	$30,415	$40,075	$60,564

4. Environmental Results-Outcomes, Outputs and Performance Measures

Outputs and Outcomes. The BAAQMD will implement a program to replace approximately 8,200 hp of prime diesel generators with 6 MW of zero-emission battery storage, and 17,500 hp of standby or backup diesel generators with Tier 4 engines in order to increase resiliency for local public agencies, businesses, and agricultural operators, and to reduce health risks associated with PM emissions. BAAQMD will submit quarterly and final reports to EPA documenting progress and results. BAAQMD will also raise public awareness regarding the viability of increasing resiliency and option of replacing generators with cleaner alternatives through direct outreach to operators of prime and backup diesel generators, and through disseminating information, including case studies, via the BAAQMD's websites

The project is estimated to result in annual emission reductions of 2.7 TPY PM2.5 and lifetime emission reductions of over 27 tons PM2.5, assuming a lifetime of 10 years and 9-fold increase of generator use, based on the number of public safety power shutoff days in 2019 and public statements from the local utilities that system hardening upgrades will take a decade. Calculations, methodologies, assumptions and emission factors per BAAQMD's permitting and reporting data for generators are all included in *Other Narrative Attachments- Project Calculations.*

Projected numbers of equipment to be scrapped and replaced, and resulting emission reductions, are shown in the tables below. Please note: the precise mix of equipment hp categories are estimated and may vary dependent on applications submitted and operator demand

Estimated Projects and Resulting Emission Reductions

Old Generator Type	New Equipment Type	Est. Quantity	PM2.5 *Qty (lbs/year)
11-16 hp Prime	Battery ~10 kw	20	263
50-98 hp Prime	Battery ~60 kw	8	523
100-175 hp Prime	Battery ~100 kw	8	1,497
200-252 hp Prime	Battery Storage ~175 kw	10	583
300-490 hp Prime	Battery Storage ~300 kw	6	784
25 hp Standby	Tier 4	8	2
125 hp Standby	Tier 4	10	133
250 hp Standby	Tier 4	15	453
500 hp Standby	Tier 4	15	669
1000 hp Standby	Tier 4	4	426
Total		**100**	**5,332**

**In the event a program category is undersubscribed, the Executive Officer/APCO may reallocate all of a program category's allocation to other categories based on demand, cost-effectiveness, and technology availability.*

Performance measures. The BAAQMD will oversee project sub-grantees and project partners. Through contractual agreements, project sub-grantees will be required to provide evidence in the form of receipts, invoices and photos or videos of the ols and replacement equipment.

Participating dismantlers will inspect the old equipment and provide documentation of destruction verification. BAAQMD has a long history of implementing MOUs and working with dismantlers. The current agreement with the prior chosen dismantlers would be amended in order to include contractual stipulations for stationary and portable engines.

For the installation of zero-emission battery storage, participating vendor and installers will provide certification forms confirming contractor business information; property where work was performed; any permit information; the type of work performed, and the device installed.

Applicants with eligible projects will be issued a contract using the BAAQMD's Carl Moyer Program as a template that includes all program requirements (e.g., for reporting and usage). Subgrantees will purchase new equipment and put it into service prior to submitting a request for reimbursement. BAAQMD staff will review each claim for accuracy and completeness. Once all requirements are met, grant funds will be distributed to the subgrantee. Milestones will be created and adhered to in order to facilitate timely distribution and expenditure of awarded grant funds.

Performance Plan. Quarterly reporting to EPA will provide an account for measurable performance of the projects to ensure the environmental objectives are being met within the appropriate timeline and budget. Reports will also document any setbacks that may occur. The final report will measure environmental achievements, cost, and any barriers that may have taken place throughout the grant period.

Outputs, or activity status of program development and implementation, will be reported tracking milestone deliverables such as:

- Program guidance and solicitation development
- Solicitation release dates
- Outreach conducted (website announcement, webinars, events)

Outcomes will be tracked, measured and reported, including:

- Number of grant agreements/contracts signed by participants
- Number of stationary and portable engines/generators scrapped, hp/kw
- Number of Tier 4 engines and zero-emission batteries purchased, hp/kw
- PM2.5 emissions reduced (TPY)
- Lifetime PM2.5 emissions reduced

Time Schedule and Tasks. Program development will begin upon EPA approval of BAAQMD's 2019 Targeted Air Shed application and continue up to 5 years from contract signing, with a proposed project period ending 2025.

Date	**Activity**

First 6 months	Accept award, develop and sign contract. Create program documents, amend contracts with Dismantler Project Partners, release solicitation, conduct outreach.
Next 4 years	Accept applications on a first come, first serve basis. Issue contracts and pay reimbursement claims. More than approx.1000 hp of stationary engines and generators will be replaced per year.
Last 6 months	Prepare and submit final reporting to EPA

The District's internal grant administration policies and procedures are designed to ensure the District recovers all allowable expenditures of federal EPA grant awards while meeting applicable federal requirements. All costs are incurred and disbursed prior to billing EPA and consistent billing methodologies are used throughout the year. Duties related to the financial management of these awards are segregated and grant processing involves multiple reviews. Management reviews and authorizes all reimbursement requests.

History and Past Performance.

Since 1991, the BAAQMD has successfully administered more than $1.2 billion in revenue for grant programs that achieve surplus emissions reductions through air quality improvement projects with sub-grantees. The majority of the BAAQMD's funding has been awarded on a reoccurring or multi-term basis based on the BAAQMD's proven success and record of accountability. DERA grants received from the BAAQQMD since 2007 that have been completed are listed in the table below.

Table 7 - Eight U.S. EPA grant agreements entered into by the BAAQMD since 2007

Project Title	Assistance Agreement #	Funding Agency	CFDA #	Status
ARRA National Clean Diesel Program	2A-00T13701-0	EPA	81.502	The BAAQMD has successfully completed this project in conjunction with the Year 1 ARB Goods Movement Program. EPA granted the BAAQMD $2 million to replace 22 heavy-duty drayage trucks and retrofit 88 drayage trucks operating at the Port of Oakland.
Air Pollution Control Program	A-00905606 A-00905607 A-00905608	EPA	66-001	The EPA provided BAAQMD with approximately $1.2 million per year over three years to provide continuing support for activities which include strategic planning and evaluation, compliance assistance, developing state implementation plans, air monitoring, rulemaking, operating permits and all other program related activities. The BAAQMD has successfully completed this project.
DERA National Clean Diesel Program	DE-00T77901	EPA	66-039	The BAAQMD has successfully completed this project in conjunction with the Year 3 ARB Goods Movement Program. EPA granted the BAAQMD $1.5 million to replace 43 heavy-duty drayage trucks operating at the Port of Oakland.
DERA National Clean Diesel Program	DE – 00T96101	EPA	66-039	The BAAQMD has successfully completed this project in conjunction with the Year 3 ARB Goods Movement Program. EPA granted the BAAQMD $898,000 to replace 22 heavy-duty drayage trucks operating at the Port of Oakland.

PM 2.5 Monitoring Network	PM-97993201-3 PM-97993201 PM-98977301	EPA	66-034	The EPA provided the BAAQMD with approximately $330,000 per year over three years to monitor fine particulate matter with the diameter equal to or smaller than 2.5 μm in order to determine compliance with the national ambient air quality standards and determine reductions in air emissions.
National Air Toxics Trends Site (NATTS)	XA-00T63001	EPA	66-034	The EPA provided the BAAQMD with approximately $150,000 per year over five years to monitor the ambient concentration of air toxic compounds and address the needs of the ambient air monitoring community in San Jose.
Near Roadway Monitoring Grant	XA-00T83001	EPA	66-034	EPA granted the BAAQMD $600,000 to develop and locate a monitoring station as part of the near-roadway monitoring network development along the Interstate 80 corridor in the Berkley/Bay Bridge area.
Lead NAAQA Airport Study	XA-00T76401	EPA	66-034	The BAAQMD has successfully completed this project to monitor lead at Palo Alto Airport, Reid-Hillview Airport and San Carlos Airport. EPA granted the BAAQMD $322,264 to determine lead emission levels associated with piston-driven aircraft.

Prop 1B Goods Movement- The BAAQMD participated in the Proposition 1B Goods Movement Emission Reduction program since 2007 in partnership with the CARB to offer $100 million over a multiple-year contacts and is currently completing the award of the remaining $10,000 million. Financial incentives to freight-sector owners of equipment to upgrade to cleaner technologies has successfully met all of the assistance agreement requirements.

The Carl Moyer Program- The BAAQMD has participated in the CMP since the program began in Fiscal Year (FY) 1998-1999. Through the CMP, BAAQMD provides grants to both public and private entities to reduce emissions of NO_x, ROG and PM from existing heavy-duty engines by either replacing or retrofitting them. Eligible heavy-duty diesel engine categories include trucks and buses, mobile off-road equipment, marine vessels, locomotives, stationary agricultural pump engines, and forklifts. In December 2019, BAAQMD submitted application to CARB and was awarded $13,800,000 for the implementation of the CMP Year 22 funding cycle.

Staff Expertise and Qualifications.

The BAAQMD will dedicate staff resources to prepare contracts with sub-awardees, conduct pre- and post- project inspections, review invoices, prepare quarterly and final reports, and make payments under this program. Staff identified below will also be tasked to ensure record-keeping is complete and quality control of information received following equipment dispersal is of the highest standard.

Staff Specialists conduct public outreach and respond to public inquiries about the program, perform evaluations of project applications, monitor project performance, conduct inspections, process payment requests, staff exchange events, prepare draft reports, and schedule meetings/conference calls with project partners and the EPA liaison.

Supervising Staff Specialists are responsible for organizing, assigning, supervising, and reviewing staff specialist work including evaluations, emission calculations, inspections, contracts,

payments, reporting and monitoring, and program outreach. They also supervise the development of administrative policies and programmatic tools for grant programs and research, administration, and technical activities necessary to achieve program objectives.

The Program Manager is responsible for program oversight and will review draft documents before they are finalized and participate in meetings as necessary. The Division Director will review the financial and programmatic objectives of the project to ensure they meet our contractual requirements. The Deputy Air Pollution Control Officer and the Executive Officer will present the project to the BAAQMD's Board of Directors and enter into the contract with the EPA, subcontractors, and sub-awardees. Ongoing record-keeping for the project will be the responsibility of the BAAQMD and will be funded through its general fund.

Karen Schkolnick, Director of the Strategic Incentives Division (SID) has worked at the BAAQMD since 2006. Ms. Schkolnick provides lead direction to a staff of 27 in the oversight, management and administration of innovative incentives programs focused on criteria pollutant emissions reductions and climate protection. Ms. Schkolnick holds a Bachelor of Arts in Environmental Studies from Oberlin College, and is a Registered Environmental Health Specialist certified by the CA Department of Public Health.

Chengfeng Wang, Manager in SID, he oversees the BAAQMD's on-road and off road incentive programs. Before joining the BAAQMD, Mr. Wang worked for the CARB as a Manager in the Air Quality Planning and Science Division, where he developed and improved CARB's emissions inventory models and provided technical support during the process of CARB's development of on- and off-road vehicle regulations. Mr. Wang earned his Ph.D. degree in Marine Studies from the University of Delaware and his Master's degree in Vehicle Application Engineering and a Bachelor of Engineering degree from the Dalian Maritime University.

Adam Shapiro, Supervising Staff Specialist, has worked at the BAAQMD since 2009. Mr. Shapiro supervises staff administering air quality improvement incentives through the on-road and off-road portions of the Carl Moyer and Goods Movement programs, including agricultural and portable engine projects. Mr. Shapiro holds a Bachelor's degree in Business Management Economics with an emphasis in Accounting from the University of California, Santa Cruz.

Amy Dao, Senior Staff Specialist, has worked at the BAAQMD since 2019 and leads off road and infrastructure related programs, focused on the replacement of heavy duty diesel equipment with zero-emission technology. Prior to her current role, she worked at Pacific Gas & Electric where she worked with industrial entities, developing large load projects. Ms. Dao earned her Master in Environmental Management from Duke University, and her Bachelor's degree in Political Science from the University of California, San Diego.

6. Leveraged Funding

BAAQMD will provide $500,000 in local funds for the replacement of engines from MSIF funds for eligible projects. The role of these leveraged funds would be used to replace CMP-eligible equipment types including and limited to residential lawnmowers and higher horsepower (>25 hp)

commercial lawnmowers. MSIF funds would leverage EPA monies to fund cost-effective equipment replacements that are not eligible under CMP guidelines.

The table below shows how BAAQMD proposes to allocate its leveraged funds for admin and project cost categories relative to EPA funds requested and total project cost.

Leveraged Funds - Subgrantees	Leveraged Funds - Admin	Total EPA Funds Requested	Total Program Costs
$500,000	$101,772	$6,308,920	$6,910,692

7. Budget

The total project cost, not including sub-grantee match, for the replacement of 100 engines is estimated to be $6,910,692, which includes $6,228,000 in project funds from EPA and MSIF that will be disbursed to sub-grantees following their completion of eligible projects.

Old Generator Type	New Equipment Type	Est. Quantity	Cost	
			Cost of New Equipment	Cost Per Award * qty
11-16 hp Prime	Battery ~10 kw	20	**$10,000**	$120,000
50-98 hp Prime	Battery ~60 kw	8	$60,000	$288,000
100-175 hp Prime	Battery ~100 kw	8	$100,000	$480,000
200-252 hp Prime	Battery Storage ~175 kw	10	$175,000	$1,050,000
300-490 hp Prime	Battery Storage ~300 kw	6	$300,000	$1,080,000
25 hp Standby	Tier 3	4	$25,000	$60,000
125 hp Standby	Tier 4	10	$70,000	$420,000
250 hp Standby	Tier 4	15	$100,000	$900,000
500 hp Standby	Tier 4	15	$150,000	$1,350,000
1000 hp Standby	Tier 4	4	$200,000	$480,000
Total		**100**		**$6,228,000**

* *In the event a program category is undersubscribed, the Executive Officer/APCO may reallocate all of a program category's allocation to other categories based on demand, cost-effectiveness, and technology availability.*

The amount of administrative costs requested from EPA will be capped at 9% of project funds awarded by EPA, or $520,920. A complete summary of the allocation of program from EPA and BAAQMD ("Leveraged Funds") for the two proposed categories is shown below:

Total Awards to Subgrantees	EPA Admin @ 9%	Leveraged Funds TOTAL	Total EPA Funds Requested	Total Program Costs
$6,288,000	$520,920	$601,772	$6,308,920	$6,910,692